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Stock Markets in Developing Countries

Key Issues and a Research Agenda

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With foreign capital funds dwindling, governments in many developing countries — with increased Bank support — are looking to develop capital markets to provide risk capital for the corporate sector. But first, some basic issues must be empirically explored.

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This paper — a joint product of the World Bank's Financial Policy and Systems Division, Country Economics Department and the Economics Department of the International Finance Corporation -- is the first in a planned series of research on the performance of capital markets and their role in providing risk capital to the corporate sector in developing countries, funded by the Bank's Research Committee (RPO 675-84). Copies are available free from the World Bank, 1818 H Street NW, Washington DC 20433. Please contact Maria Raggambi, room N9-041, extension 37657 (49 pages).

The International Finance Corporation (IFC) is heavily involved in developing capital markets in developing countries — through technical assistance, through direct investments (equity and loans) in financial market institutions, and through its activities (with the Emerging Markets Database and various country funds) to stimulate portfolio investment in stock markets in developing countries.

The Bank's increased concern with capital market issues is recent. This concern reflects growing dissatisfaction with the paradigm of bank-based finance with heavy government intervention — and awareness of the need for a more integrated approach to financial sector development, resource mobilization, and the promotion of investment and economic growth.

Several financial sector loans have included policy recommendations supporting capital market development, a trend that should accelerate as Bank staff gain competence handling the complex issues involved. To the extent that problems in the banking sector originate in unbalanced capital structures at the corporate level and failure to develop equity markets, capital market development clearly is essential to banking reform. The complementarity of the banking sector and securities markets needs exploration.

There is much debate — in both developed and developing countries — about what kinds of financial institutions and markets best serve economic growth. To what extent, one might ask, can the superior performance of Japanese and German economies be attributed to their market-based system (with a focus on short-term gains)? Prominent in current debates about the competitiveness of industrial nations are issues of corporate financial structure and financial market organization.

Drawing on recent experiences in India and Korea, Dailami and Atkin consider key issues that arise in connection with the development of equity markets in developing countries. Under what conditions does it make sense to encourage the development of equity markets? Is a functioning equity market a prerequisite for liberalization of the banking system? Is it useful to think in terms of an optimal debt/equity mix for a developing economy, or for a corporation in a developing economy?

What is the appropriate regulatory regime for a developing country securities market? Without effective regulation, international investors will not have the confidence to commit resources to developing country markets.

Good management skills are scarce in developing countries. How can matters be arranged to make optimal use of those management resources? The stock market's role in effecting changes in corporate governance could be enormously helpful to economic development.

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I. INTRODUCTION

The provision of funds to finance domestic capital formation is increasingly being recognized as a key factor bearing upon the prospects for long-term economic growth in developing countries. Faced with the reality of a much reduced supply of foreign funds from previous sources (such as commercial banks), governments in many developing countries are giving increased attention to capital market development as a way of improving domestic resource mobilization, enhancing the supply of long-term capital and encouraging the efficient use of existing assets. Moreover, the ongoing debt crisis is serving to focus attention on the importance of equity rather than debt, particularly in financing risky projects with long gestation periods.

It is not surprising, therefore, that the performance of capital markets and their role in providing risk capital to the corporate sector have become important features of the Bank's financial sector operations and strategies. Such considerations have, of course, long been central to the IFC, which, in addition to making direct investments in capital markets institutions, has served as the focal point of the Bank group's technical assistance on capital markets. The Bank's increased concern with capital market issues is, however, of recent vintage. The changed thinking in the Bank reflects growing dissatisfaction with the paradigm of bank-based finance with heavy government intervention. It also reflects increased awareness of the need for a more integrated approach to financial sector development, resource mobilization, and the promotion of investment and economic growth. In this approach, capital

markets serv· both as an instrument of reform of the banking sector and as an integral part of the long-term development of the financial system.

Within such a long-term perspective, stock markets are expected to play several key roles. First, by spreading the risks of long-term investment projects, the growth of stock markets can lead to a lower cost of equity capital and thereby stimulate investment and growth. Second, by imposing a degree of control over the investment behavior of companies through continuous monitoring of their share prices and thereby of the implied possibility of merger and takeover, stock markets can contribute to more efficient investment. Third, by attracting foreign portfolio capital, the expansion of stock markets can serve to enhance the supply of investable resources in developing countries. Stock markets also have a role in domestic resource mobilization and provision of fresh equity capital to the corporate sector. This is particularly important in emerging capital markets, where the early expansion of stock markets is often characterized by an increase in the number of companies going public, or by enhanced offerings of seasoned shares by listed companies. This last role has been of considerable importance in both India and Korea.

It would be erroneous, however, to assume that widespread agreement exists among economists or in the broader policymaking community about these aspects of the stock market, or about their effectiveness and desirability. This is part of a wide-ranging debate

about the kinds of financial markets and institutions that best serve economic growth. Analysis, mostly in the context of developed countries, shows that these risk-sharing and efficiency enhancing functions of the stock market are not without cost. The following are the three main types of costs involved.

The first is the agency cost inherent in the separation of management and ownership. This arises from the institutional arrangement under which the shareholder bears the risk, while management has control over the investment and financial decision-making process. The possibility that managers may pursue goals of their own that may be at variance with shareholders' objectives of profit or market value maximization creates an incentive problem with social welfare implications. This type of cost is, of course, common to other modes of finance, such as bank debt [Stiglitz and Weiss (1981, 1986)]. It has its roots in the moral hazard problem inherent in environments with asymmetric information and with costly monitoring and enforcement mechanisms [Jensen & Meckling (1976), Hellwig (1989)]. In other words, although management can be replaced by shareholders, this is a costly procedure.

The second type of cost is in some sense more fundamental and is more specific to the stock market. This concerns the efficiency with which project risks are diversified and priced. Are the capital markets functioning, in practice, in the manner prescribed by modern financial

theory or are there binding imperfections and distortions? For example, some research claims that observed volatility is not warranted by changes in fundamentals [Shiller (1981); Leroy and Porter (1981); Culter, Porterba and Summers (1980)], and that this has adverse implications for capital formation and social welfare [De Long, Shleifer, and Summers (1989)]. On the other hand, there are many studies providing evidence of the market's rationality. Merton (1987) reviews the state of the debate.

The third type of cost relates to the role of the stock market in takeover activities and its impact on the competitiveness and efficiency of companies [Scherer (1986), Ginsburg and Robinson (1986), Hughes and Singh (1987)]. One important concern is the degree to which takeover threats, and actual takeover, may weaken the competitiveness of companies by inducing a bias towards short-term profits and financial returns. Does the need to provide shareholders with satisfactory short-term returns inhibit corporations from making the investments needed to ensure their long-term success? To what extent can this short-termism be blamed for the lagging productivity and growth performance of the U.K. economy and to some extent the U.S. economy relative to the Japanese and German economies? To what extent can this superior performance of Japanese and German economies be attributed to their bank-based financial systems as compared to the market-based systems of the United States and the United Kingdom?[4]

These issues are vitally important, not just in the context of developing countries, but also in Eastern European countries that are now

on the verge of transition from heavily controlled systems of resource allocations to systems based on market incentives and mechanisms [Jarri (1989); Vahcic (1989)]. What is striking about these issues, however, is the lack of systematic analysis and empirical investigation. The existing literature is focused mostly on the experience of the highly developed and mature capital markets of the industrial countries, particularly the United States and the United Kingdom. Only a small number of papers deal explicitly with the role of stock (and, more generally, securities) markets in developing countries. In one of the earliest papers, Wai and Patrick (1973) surveyed existing markets and concluded that only the market in Brazil had had a positive development impact. This rather negative conclusion was reinforced by Calamanti (1983), who argued that securities markets hinder economic development by exacerbating economic fluctuations and distorting the allocation of wealth. This conclusion has been contested, notably by Drake (1985), Arowolo (1971) and van Agtmael (1984), but all this literature relies heavily on a priori argumentation.

The objective of this paper is to identify and investigate issues particularly relevant to developing countries that have been neglected by the literature.

There are three issues on which we wish to concentrate. These are first, the relationships between the development of the stock market and company finance; second, the impact of the stock market on the

efficiency of resource use; and third, the market's role in increasing integration with world financial markets. To keep the paper to a manageable size, we have chosen to focus on two countries: India and the Republic of Korea. These countries have been chosen for a number of reasons. In both countries, the data are available to examine the issues. Their economies are very different, as are their financial markets; but in both, as is detailed later on, recent developments provide the opportunity to gain a better understanding of the various policy, institutional, and regulatory factors underlying their stock market growth and transition from bank-loan to equity market sources of finance. There are obvious limitations of this choice. Neither of the two countries is highly indebted (although Korea was) and neither has experienced the macroeconomic instability that has affected much of the developing world. Moreover, this paper is the first in a planned series reporting the results of detailed research recently begun in a number of developing countries. This paper, therefore, is designed to set out issues and to offer some preliminary hypotheses for the broader research project.

II. RECENT DEVELOPMENTS IN INDIA AND KOREA

A striking feature of the Indian and Korean economies in the 1980s that has received little attention is the impressive growth in their stock exchanges and the increasing role of these stock exchanges in supplying capital to the corporate sector. In the case of Korea, the stock market has grown almost fortyfold in just the past ten years; its capitalization was US$3.8 billion (6.3 percent of GNP) in 1980, and had risen to US$140.9 billion (73.1 percent of GNP) in 1989. It is now among the ten largest stock markets in the world, considerably larger than the exchanges in Brazil, Mexico, Malaysia, New Zealand, Portugal, and Spain (see Table 1). In terms of its contribution to corporate finance, the trend has been equally impressive. The total volume of capital raised by listed companies through issuance of shares (both rights issues and public offerings) has increased from 171.15 billion won in 1980 (US$0.3 bn) to 7770.08 billion won in 1988 (US$10.6 bn), an annual average growth rate of 81 percent in nominal and 73 percent in real terms (see Table 2).[2] For the corporate sector as a whole, equity financing now accounts for 23.7 percent of total corporate external financing, compared to 34.4 percent from bank loans.[3]

In the case of India, whose stock market is the 23rd largest in the world (approximately the same size as those of Thailand and Mexico), growth in the 1980s has been less spectacular, but nonetheless impressive. In 1980, market capitalization was US$7.5 billion (4.4

Table 1 : WORLD STOCK MARKETS [1]

(ranked by size)

(market capitalization in 1989 ; US$ billion)

Ranking	Country	Amount
1	JAPAN	4393
2	U.S.	3506
3	U.K.	827
4	GERMANY	365
5	FRANCE	365
6	CANADA	291
7	TAIWAN	237
8	ITALY	169
9	NETHERLANDS	158
10	KOREA	141
11	AUSTRALIA	137
12	SOUTH AFRICA	131
13	SPAIN	123
14	SWEDEN	119
15	SWITZERLAND	104
16	LUXEMBOURG	80
17	HONG KONG	77
18	BRAZIL	44
19	MALAYSIA	40
20	DENMARK	40
21	SINGAPORE	36
22	FINLAND	31
23	INDIA	27
24	THAILAND	26
25	NORWAY	25
26	MEXICO	23
27	AUSTRIA	22
28	NEW ZEALAND	13
29	PORTUGAL	11
30	KUWAIT	10

1 The IFC's 30 largest national stock markets

Source : IFC, Emerging Stock Markets Factbook, 1990

Table 2: Corporate funds raised through equity market in Korea

(billion Won)

Year	Initial public offerings		Offerings by listed companies		Total equity funds raised	Initial public offerings/ total equity
	Number	Amount	Number	Amount	Amount	percent
1975	62.00	39.88	68.00	82.93	122.81	32.47
1976	87.00	74.01	81.00	101.94	175.95	42.06
1977	49.00	44.11	97.00	141.86	186.97	23.59
1978	33.00	41.52	148.00	285.20	326.72	12.71
1979	5.00	4.88	98.00	211.93	216.80	2.25
1980	1.00	0.35	52.00	170.80	171.15	0.20
1981	2.00	3.05	81.00	302.99	306.04	1.00
1982	-	-	69.00	276.87	276.87	0.00
1983	3.00	30.80	102.00	431.77	462.57	6.66
1984	14.00	81.39	107.00	397.67	479.06	16.99
1985	11.00	35.06	60.00	259.53	294.59	11.90
1986	18.00	43.06	110.00	797.71	840.77	5.12
1987	44.00	243.76	178.00	1654.95	1898.71	12.84
1988	12.00	1049.43	298.00	6720.64	7770.08	13.51

Source : The Korean Securities Dealers Association, Securities Market in Korea, various years

percent of GDP), whereas in 1989 it was US$23 billion (8.5 percent of GDP).[24] In terms of numbers of individual shareholders, the Indian market is the third largest in the world, behind only those in the United States and Japan. Throughout the 1960s and 1970s, new issues of both equity and debentures floated in the Indian capital market averaged around 1 billion rupees per year. In 1980, the total was 1.64 billion (US$0.25 bn). By 1987, however, this total had grown to 44.12 billion rupees (US$3.5 bn). The amount of equity raised increased from 0.90 billion rupees in 1980 (US$112 million) to 8.78 billion rupees in 1987 (US$700 million), with the balance accounted for by debentures (see Table 3). In terms of overall corporate financing needs, the capital market accounted for around 8 percent of gross asset formation in the corporate sector during the 1970s, a proportion that rose to 15 percent in the period 1980-87.[25]

In both countries there have been important macroeconomic and policy changes accompanying the growth of stock markets. In the case of Korea, the 1980s have seen measures to reduce inflation, a large growth in household savings, and a sharp turnaround (in 1986) of the country's balance of payments position from deficit to surplus. These developments have set in motion a period of high stock market prices, high investment, high profitability, and continued high rates of economic growth.[26] In the case of India, the 1980s have seen some liberalizing reforms of economic policy. These reforms have led to an improvement in India's growth performance, although the trade balance has worsened. The

Table 3 : Funds raised through capital market by non-government public limited companies and public sector units in India

(Rupees crore)

Year	Equity issues		Preference shares		Debenture issues		Public sector bonds	Total issues value
	Public offerings	Rights issues	Public offerings	Rights issues	Public offerings	Rights issues		
1980	66.10	23.00	1.90	0.20	34.10	38.60		163.90
1981	256.20	23.80	2.00	0.10	137.10	58.90		478.10
1982-83	245.48	13.17	1.76	0.58	150.20	294.80		705.99
1983-84	337.48	44.12	1.20	0.50	21.50	432.70		837.50
1984-85	353.50	9.50	0.10	0.00	42.50	650.80		1056.40
1985-86	785.10	73.10	0.90	0.30	92.00	751.50	353.77	2056.67
1986-87	792.10	84.70	0.20	0.60	479.00	1077.60	1978.00	4412.20
1987-88	na	na	na	na	na	na	1823.50	3572.50

Note : 1980 and 1981 are for calendar years

Source : Securities and Exchange Board of India, Capital Market During Eighties, 1988

industrial sector has grown at an annual average rate of 7.1 percent in the 1980s, compared to 3.8 percent in the 1970s. Gross capital formation in the 1980s was four times greater than in the entire decade of the 1970s. These developments highlight the macro dimensions of stock market performance.

The strikingly close relationship between aggregate corporate real investment and the stock market in Korea is depicted in Figure 1.[7] This relationship is explored in further detail in Dailami (1990). The positive correlation between the stock market and corporate investment can be explained as the result of two mutually reinforcing developments: (i) an increase in corporate profitability resulting in higher stock market prices and a move to equity financing; and (ii) a decrease in the cost of equity because of higher stock market prices, resulting in higher corporate investment and profitability. Figure 2 illustrates how this can take place. In this diagram, the cost of funds is plotted against investment. The supply schedule shows the cost of funds rising as investment increases; the marginal efficiency of investment schedule, on the other hand, slopes the other way. The diagram shows that a simultaneous shift in the marginal cost of funds and marginal efficiency of investment schedules can lead to higher levels of investment and a move to equity financing. The marginal cost of funds shifts downwards, reflecting the lower cost of equity capital, and the marginal efficiency of investment shifts upwards due to higher profitability. The new point of intersection, denoted by A_1 determines the new equilibrium levels of investment and cost of funds.

Figure 1: Korea: Relationship Between Aggregate Stock Market Price And Corporate Investment: 1964-1986

Annual Percentage rate of change

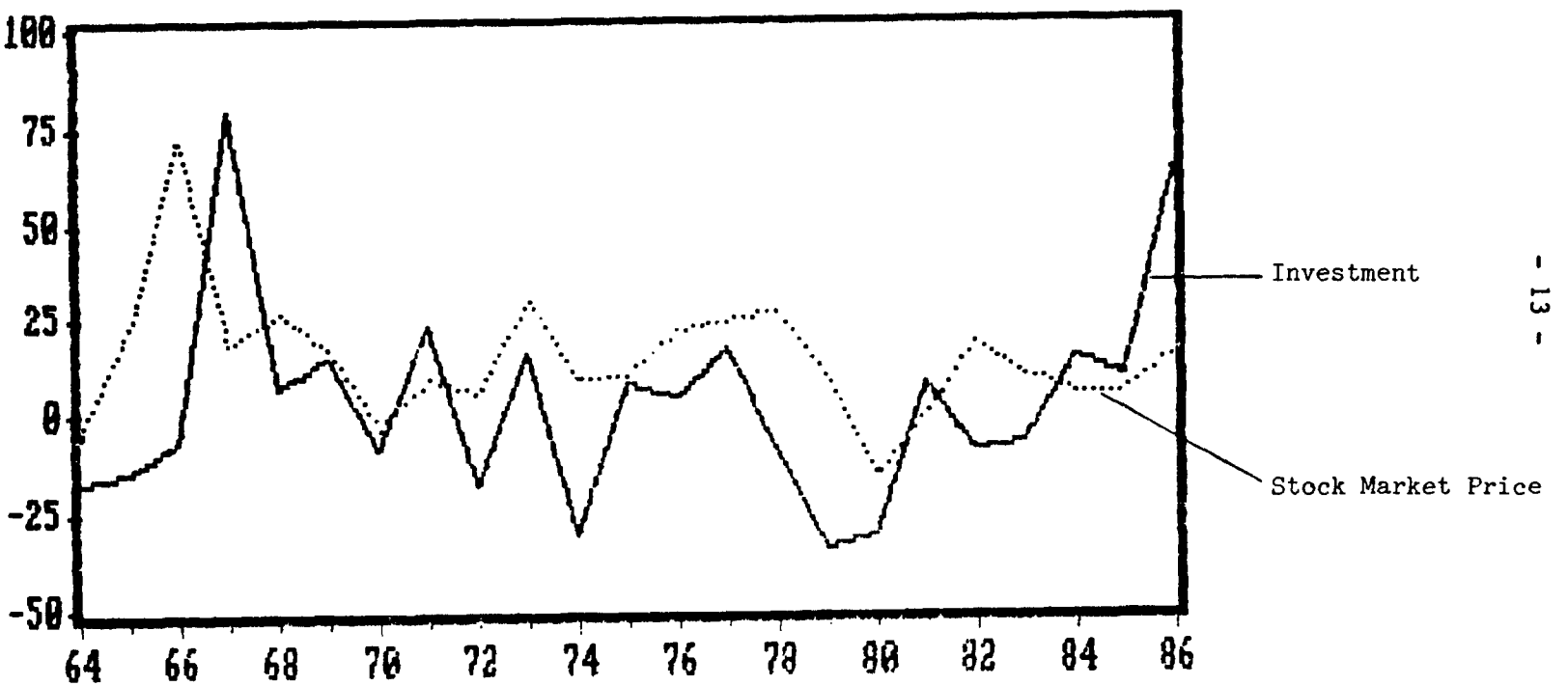

Figure 2: Marginal Cost of Funds and Investment Schedules

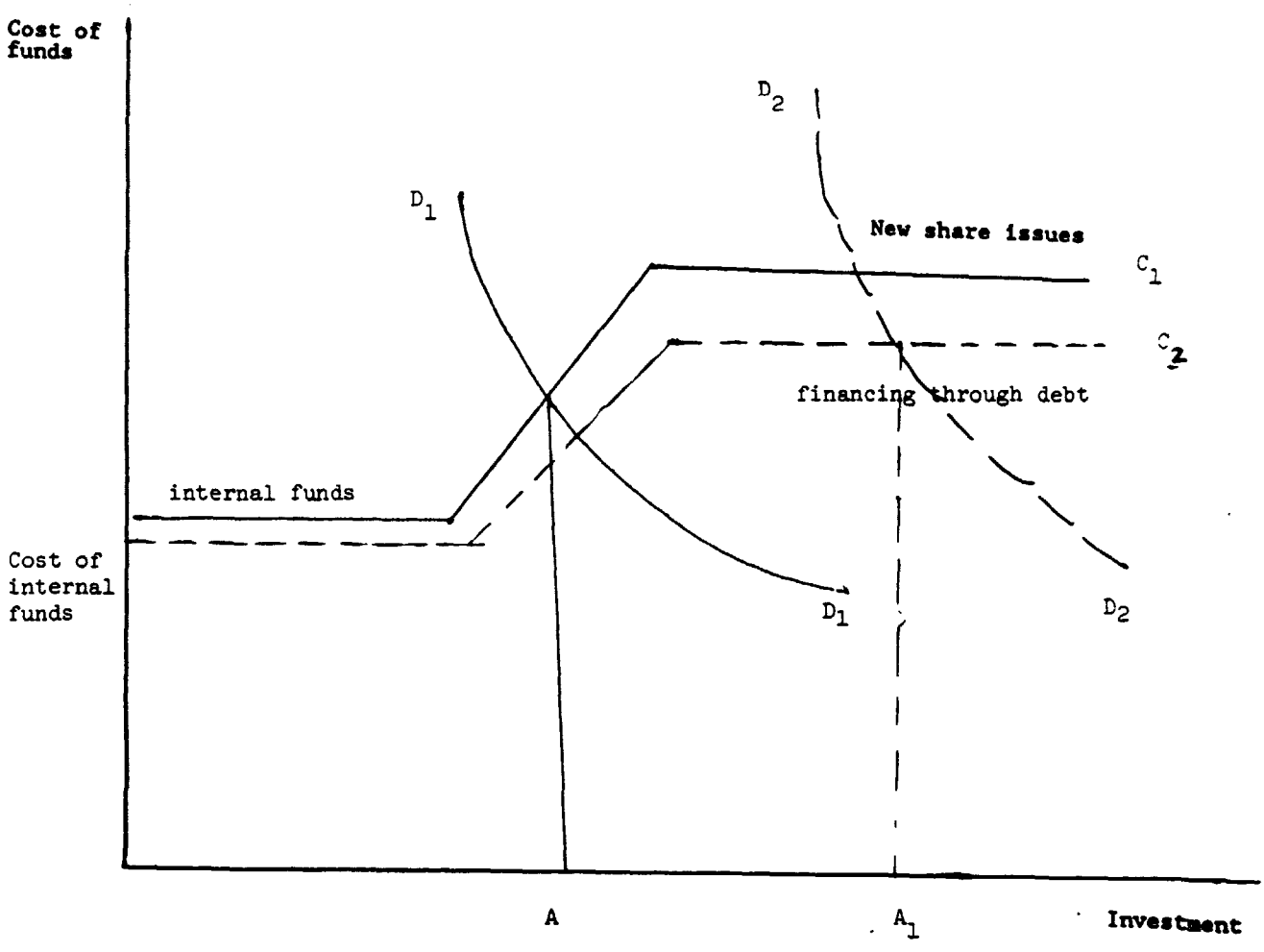

Table 4 : Measures of Corporate Profitability

Korean Non-financial Corporate Sector , 1975 - 1986

Year	Real return on capital employed (percent) 1	Tobin's Q 2
1975	6.03	0.81
1976	10.73	0.80
1977	11.21	0.76
1978	11.87	0.73
1979	9.14	0.65
1980	5.82	0.69
1981	8.17	0.69
1982	8.36	0.73
1983	9.52	0.78
1984	9.47	0.88
1985	9.76	0.90
1986	11.27	0.94

Note : (1) - Return before corporate taxes

(2) - Ratio of book value of debt plus market value of equity to replacement cost of

Source : See appendix A

Table 4 draws on both company accounting and market valuation data to provide two basic measures of corporate profitability for the nonfinancial corporate sector of Korean economy during the period 1975-1986. The first is an estimate of real return to capital employed by the business sector and is defined conventionally as the ratio of inflation-adjusted operating profits plus net interest paid to total capital employed.[8] It is measured before adjusting corporate earnings for corporate taxes, but after adjusting them for inflation. It is thus the real return that the corporate sector, as a whole, has earned on one unit of its capital employed. As Table 4 shows, this has increased from 6 percent in 1975 to 11.3 percent in 1986, although there was a notable decline in the early 1980s.

The second measure of corporate profitability is based on the familiar Tobin's Q, which is the ratio of two valuations of corporate capital: (i) the securities market valuation of the portfolio of debt and equity claims outstanding; and (ii) the replacement cost of capital. It thus measures the extent to which the securities market values a unit of corporate capital relative to the replacement cost of that unit. A value of $Q > 1$,[9] or when Q is rising, is a sign of rising investment opportunities. The rise in Q is visible from Table 4 although the downturn in the early 1980s, reflecting the recessionary conditions of that period, can also be seen.

III. SOME KEY ISSUES IN STOCK MARKET DEVELOPMENT

The brief review of recent Indian and Korean experience given above suggests that a number of important issues deserve exploration. In this section, we turn to consider some of these issues.

III.1. Provision of Equity Capital

Central to understanding the performance of the stock market in funding the corporate sector is analysis of determinants of supply of, and demand for, corporate equities. Relevant to such an analysis are considerations of both broader interest rate and taxation policies, as well as more market-specific, regulatory, and institutional factors that influence optimal financing mixes of companies, on the one hand, and asset portfolio composition of investors, on the other.

On the demand side, one important consideration is the return on equity relative to other financial assets. In this respect, as Table 5 shows, equity has been a very attractive opportunity in most developing countries, at least in the 1980s; the real pre-tax rate of return on the stock market (dividend yield plus capital gains) over the period 1980 to 1989 has been 23 percent in Korea and 21 percent in India, compared to a corresponding rate on financial assets of -0.7 percent in Korea and -0.5 percent in India. Thus, on a pre-personal tax basis, equity has enjoyed a considerable premium over bank deposits. But important questions

Table 5 : Real Returns on Financial Assets for Selected Developing Countries
(period average , %)

Country	Years	Return on stocks				Interest Rate *	
		Dividend Yield	Capital Gains	Total Nominal	Total Real	Nominal	Real
Argentina	80-88	1.2	311.7	312.9	26.5	246.3	-40.0
Brazil	80-89	6.1	621.1	627.2	307.6	200.9	-118.7
Chile 1/	80-87	5.3	36.9	42.1	19.4	33.3	10.5
Cote D'Ivoire	81-88	NA	-2.7	NA	NA	9.2	3.8
Colombia 2/	85-89	8.1	41.5	49.6	25.5	28.4	4.3
Costa Rica	86-87	9.0	127.0	136.0	121.7	15.4	1.0
Greece	81-89	7.2	33.4	40.6	21.1	15.4	-4.1
Indonesia 3/	81-89	13.9	31.5	45.4	36.7	13.1	4.4
India 4/	80-89	3.0	27.2	30.2	21.0	8.6	-0.5
Jamaica	81-89	5.0	51.8	56.8	42.5	0.0	-14.3
Jordan	80-89	3.2	5.4	8.5	1.8	11.2	4.5
Kenya 5/	81-88	NA	11.8	NA	NA	11.1	0.5
Korea	80-89	4.2	27.0	31.1	22.7	4.5	-3.9
Sri Lanka	85-88	NA	18.7	NA	NA	7.1	-0.7
Morocco	81-88	9.0	8.8	17.7	9.7	53.8	45.7
Mexico	80-89	6.3	110.5	116.8	47.7	7.8	-61.3
Malaysia	80-89	2.2	15.6	17.7	14.1	10.5	6.8
Nigeria	85-89	7.3	26.8	34.1	14.1	9.1	-10.9
Pakistan	80-89	7.5	10.1	17.6	10.3	12.8	5.5
Peru	83-89	0.0	843.2	843.2	184.0	14.4	-644.7
Phillipines	85-89	3.3	84.5	87.8	78.4	11.5	2.1
Portugal	86-89	1.3	69.8	71.1	60.3	6.1	-4.7
Thailand	80-89	8.1	24.8	33.0	27.2	42.2	36.4
Trinidad & Tobago	82-89	6.4	-11.5	-5.1	-15.6	63.7	53.1
Turkey	87-89	5.9	247.5	253.4	192.2	13.3	-48.0
Uruguay	81-89	NA	75.2	NA	NA	9.7	-44.3
Venezuela	85-89	1.8	50.4	52.2	19.2	9.3	-23.7
Zimbabwe	80-89	12.4	17.5	29.9	17.1	7.8	-5.0

Source : IFC : Emerging Stock Markets Factbook, 1990

IMF : International Financial Statistics, various issues

Reserve Bank of India : Reserve Bank of India Bulletin, various issues

Note : * Generally it refers to the rate on short-term time deposits (under 6-month) except for India where it refers to time deposits of 1-3 years of maturity
1/ Average for 1980-1989 period, not including 1984
2/ Average for 1985, 1988, 1989
3/ Dividend yield for 1988 and interest rate for 1986 are excluded
4/ Based only on Bombay Stock Exchange data
5/ Only 1988 observation is available, dividend yield for that year is 8.4%

remain. To what extent does such an observed premium in favor of equity reflect the impact of differential taxation of capital income in these countries, and to what extent does it reflect the existence of risk premia associated with uncertainty? While a rigorous investigation of this question is beyond the scope of this paper, Table 6 focuses on the experience of Korea and provides estimates of real realized returns on the stock market and on government bonds on a net-of-personal-tax basis. It can be seen, for example, that relative to government bonds, equity investment in Korea has earned a considerable premium, amounting to an average of 8.9 percentage points, over the period 1980-1989. Such a premium partly reflects the usual risk premium that investors normally require to hold riskier equity, and partly the influence of speculative pressures on stock prices.

What of the determinants of the supply of equity in developing countries, that is, the conditions under which corporations may opt to issue equity to raise new capital? The critical issue is the understanding of the nature of various capital market imperfections in developing countries and their implications for the financing behavior of companies. In the world of perfect capital markets underlying the classic Modigliani-Miller (1958) theorem, financing decisions made by companies are irrelevant; i.e., given their financing needs, firms are indifferent between drawing on retained earnings, issuing new shares, or having recourse to credit markets. What are, then, the factors that make companies choose one form of financing over another; and, more

Table 6 : After-tax real return on financial assets for Korea

(1980 - 1989)

Year	Return on Equity (percent) 1	Return on Government Bond (percent) 2
1980	-32.52	3.58
1981	9.54	5.12
1982	-7.67	7.67
1983	-6.95	7.35
1984	14.92	7.86
1985	12.10	7.32
1986	65.13	8.35
1987	57.83	6.74
1988	34.07	6.46
1989	3.24	7.10
Annual average (1980 -1989)	14.97	6.76

Notes : 1) Real return on equity is calculated as the net of personal tax dividend yield plus capital gain minus rate of inflation in GDP implicit price deflator

2) Real return on government bond is the net of personal tax nominal yield on government bond less rate of inflation in GDP implicit price deflator

Sources : See appendix A

specifically, why have companies in developing countries traditionally relied so predominantly on debt to finance their investment and growth?

Debt versus Equity. Perhaps the most pronounced capital market imperfection in developing countries that has generated a strong bias against equity financing has been the pervasive nature of government intervention in the financial system. Interventions such as directed credit allocation to favoured sectors through subsidized interest rates, artificial ceilings on rates, and bailouts of corporations in financial difficulties have generally resulted in keeping the before-tax cost of debt artificially low. The tax deductibility of interest expenses at the corporate level has usually reinforced this advantage. The consequence has been a corporate sector that is ever more heavily indebted with adverse implications for financial and macroeconomic stability.

An additional important factor favoring company debt-financing has been the role of taxes. This has been the subject of a growing body of literature in public and corporate finance. The literature has, however, centered almost exclusively on the United States and the United Kingdom, where there is separate treatment of corporate and personal income and where debt is treated more favourably than equity. Thus, in the case of corporate taxes in the United States, distributions to debt securities are generally deductible against corporate income, whereas distributions against equity claims are not. The advantage this gives to debt may be partially or, under some circumstances, totally offset by the

higher taxation of debt relative to equity at the personal level [Miller (1977)]. Within the framework established by this body of literature, optimal corporate financing decisions involve balancing the net benefits of borrowing, taking into account both corporate and personal taxation, against various leverage-related costs, such as bankruptcy costs, costs due to agency and asymmetric information problems, or a loss of nondebt tax shields. [See DeAngelo and Masulis (1980), Kim (1982), Ross (1985)]. Depending on the significance and magnitude of these costs and the relevant tax parameters, an optimal corporate capital structure (at the firm or the aggregate level) can be derived and used as a basis for analyzing the impact of changes in tax structures on financing decisions.

While there are important similarities in the prevailing tax codes in India, Korea and the United States in terms of corporate taxation, there are important differences in personal taxation. One such difference, for example, is the much lighter taxation of interest income relative to equity income in Korea than in the United States. Thanks to various exemptions, the effective maximum tax rate on interest income (including defense, education, and residence taxes) in Korea is 18 percent compared to 28 percent in the United States (after the tax reform of 1986). But income from stocks is taxed much more heavily in Korea; although capital gains are not subject to personal taxation there, dividend income is taxed at a rate as high as 70 percent for high income individuals, once the defense and residence taxes are taken into account.

Thus, in Korea the after-tax cost of debt relative to equity financing has been lowered at both personal and corporate levels. This explains, in fact, the reason why corporations in Korea are so much more leveraged than their counterparts in the United States, or even Japan. Estimates provided by Kim (1989a), for instance, show that the average equity ratio for Korean listed corporations during 1977-1986 is about 16 percent, compared to corresponding values of 40 percent for Japanese corporations, and 50 percent for U.S. corporations.

Issuing New Shares. Companies resort to equity markets to raise funds either in the form of initial public offerings or by issuing seasoned stocks. These practices are motivated, however, by special reasons and are reserved for special circumstances. They are not regular features of corporate life, such as payments of dividends or resort to credit markets for working capital needs. Equity financing does incur high costs, both directly in the form of underwriters' commissions and legal and auditing expenses, and, indirectly, in the form of underpricing of initial public offerings or the market's possibly adverse reaction to company announcements of stock offerings. The underpricing component is very serious in developing countries, where regulations often require that new issues be priced at, or very close to, par value. The extent of this underpricing for Korean firms going public over the period 1984-86 has been estimated to be in the order of 40 percent [Kim (1989b)].[10] Given that the average fraction of the firms sold to the public in these offers was 26 percent, this implies that the existing shareholders

incurred an average wealth loss of 10.6 percent. In other words, the indirect cost associated with external equity financing through initial public offerings in Korea is, on average, about 10.6 percent compared to a corresponding value of 4 percent in the United States [See Kim (1989b)]. Given that external equity financing is so expensive, the question arises as to why companies raise capital through stock markets.[11]

The existing literature provides some clues about what factors can be expected to have an important bearing upon company decisions to issue common stock in order to raise capital. The important factors are: (i) risk sharing; (ii) dilution of control, and (iii) asymmetry of information. These are considered below.

Perhaps the most persuasive reason for firms to issue additional shares is the benefit of risk sharing. When a closely held firm is faced with a need to finance a new project that requires a large amount of new capital, the owner/manager will have a high reservation price for bearing additional risk because he cannot achieve efficient risk diversification. The high reservation price for risk means that the firm will be less inclined to undertake investments with uncertain payoffs. This problem can be resolved by issuing new shares to the general public. A wide ownership of the firm's common shares allows the risk associated with the new project to be spread across many stockholders who can, in turn, diversify across different corporations. This

diversification eliminates the unsystematic (diversifiable) risk of the project and, hence, lowers the risk premium component in the cost of capital.

An important disadvantage of issuing new shares, however, is the dilution of control. In developing countries, the control issue is probably the most important deterrent to going public or issuing additional shares of seasoned stocks. This effect should be most significant for privately held firms and closely held public firms, where family based ownership is very dominant and where informational asymmetry between the owner/manager and outside investors is very severe.

When insiders of a firm know more about the true value of the firm than outside investors, issuing seasoned stocks can signal to the market that the insiders believe that existing shares are overpriced. Such a negative signal will have an adverse impact on the value of the firm. Consistent with this negative signalling hypothesis, research in the United States indicates that stockholders suffer a significant wealth loss of about 4 percent on the announcement of seasoned stock offerings. In the case of Korea, however, observed market reactions to seasoned common stock offerings seem to be strikingly different from those in the United States. In the United States, it has been observed that share prices tend to decline following new securities issues, with the extent of the decline being a function of the type of security being offered and the nature of the business of the offering corporations [Smith (1986);

Asquith and Mullins (1986)]. In Korea, as in Japan, however, the announcement of seasoned stock offerings seems to be viewed as good news and market reaction is generally positive rather than negative [Kim (1989)]. It appears that this is because investors view share offerings as a signal of profitable investment opportunities for the firm. Does this difference between the U.S. and Korean market reactions to announcements of new share offerings reflect the different degrees of informational asymmetry, or the difference in methods of offerings? This an important question meriting serious consideration.

III.2. Regulatory and Institutional Framework.

Regulatory and institutional issues obviously have an important role in stock markets, and that role is probably more important when they are growing rapidly, as they have been in Korea and India. In both countries there have been difficulties with market disasters and crashes, and in both there has been steady evolution in the regulatory framework governing both the workings of the markets themselves and relationship between the markets and the rest of the economy. There are three important issues.

The first concerns the regulatory environment of the stock market itself. Markets need to maintain the confidence of the investing public by ensuring there is open and fair price formation. In India, in

particular, there have been problems with insufficient liquidity in some share issues and with lax listing requirements. This has adversely affected investor confidence and threatens the future growth of the market. Standards of investor protection and the full, prompt, and reliable disclosure and dissemination of information are vitally important.

The second concerns the pattern of institutional development, particularly the growth of unit trusts and contractual savings institutions. These institutions play a vital role in stock markets, helping to maintain liquidity and efficient pricing. IFC has made a number of investments in security market institutions (for example, a securities financing company in Korea and a mutual fund company in Thailand) in order to overcome institutional deficiencies in developing country stock markets.

The third area concerns the degree of international openness of the market. Korea has been progressively liberalizing the restrictions on international access to its capital market with considerable success. India's market is more restricted, although there are a number of incentives for nonresident Indians to participate in the market. Further liberalization is planned.

III.3. Efficiency

Of equal importance to the stock market's role in mobilizing resources and allocating them to the corporate sector has been its function of enhancing the efficiency of investment. In fact, one might argue that this is its distinctive feature, since in most countries, external equity has represented only a small proportion of the financing needs of corporations. An important role for a stock market, therefore, has been to impose a degree of control over the investment behavior of countries through its continuous valuation of their share prices and the implied possibility of mergers and takeovers. Companies with "perceived" undervalued share prices find it prohibitively expensive to raise equity funds. They are also vulnerable to being taken over by companies with more efficient management. Conversely, firms with high share prices find it comparatively cheap to raise equity funds to finance investments (or takeovers). Through these mechanisms the stock market evaluates companies, compares investment opportunities, and selects those which offer the highest rates of return.

Again, in the case of the developed economies, there has been empirical examination of these issues. A range of studies (summarized by Caves 1988) have established that shareholders in the firms targeted in mergers and acquisitions gain substantially from takeovers. The gains to other parties are less clear cut, with little convincing evidence that the consolidated firm performs better than a market norm. There are

those who argue that the "gains" from the takeover process are merely redistributions from one set of stakeholders in a firm (employees, suppliers) to another set (equity holders), and that takeovers result in reduced ability of firms to participate in long-term, implicit contracts with its stakeholders [Shleifer and Summers (1988)]. Only in the case of Canada is there evidence that takeovers produce benefits for shareholders in both bidder and target firms [Eckbo (1986)].

The key point, however, is that an economy needs some mechanism for effecting change in corporate governance. In the bank-dominated systems of Japan and West Germany, this discipline is imposed by the banks, whose financial health is dependent on the health of their corporate clients and with whom they have very close relationships. Banks in these countries also have the management abilities to see that their interests are protected. In stock-market-based systems there are two mechanisms. In the first place, management can be ousted by shareholders directly. Secondly, there is the possibility of mergers and acquisitions. In India, the government has recently allowed hostile takeovers, but since government-owned financial institutions are by far the largest shareholders in companies, it is not clear what this freedom amounts to. Are changes in management imposed by what is, de facto, a market or a political process? Similarly, how does the Korean stock market impose efficiency on its listed companies? The question of how developing country stock markets impose efficiency on their listed firms is one requiring further investigation.

A closely related question is the extent to which an organized equity market can contribute to the effectiveness of financial liberalization in developing countries. It has been argued by Cho (1986), for instance, that a well-functioning equity market is a necessary condition for increasing allocative efficiency through liberalization of interest rates and other restrictive regulations imposed on the banking sector in developing countries. In the absence of an equity market, Cho (1986) argues for a more tempered approach towards financial sector liberalization and envisages a degree of government intervention in the financial system as necessary.[12]

A final question is, what stands in the way of the stock market becoming a more important mechanism for encouraging efficient use of capital in Korea and India? An important aspect of this question relates to the volatility of those markets. Is the observed volatility in developing country stock markets excessive in light of international experience? Given the heavily regulated nature of their financial systems, there is the argument that the stock market represents one of the few opportunities for speculative activity. Excessive market volatility, though compatible with efficient pricing, is, however, unlikely to inspire confidence in firms and investors.

There is, of course, a substantial body of literature on the question of market efficiency. While most of this has focused on markets in developed countries, there have been some studies of emerging

markets. Sharma and Kennedy (1977), Sharma (1983), Darrat and Mukherjee (1987), Kapur and Ravallion (1988), and Errunza and Losq (1985), for example, review a range of emerging markets. Generally speaking, they find mild pricing inefficiencies in these markets, in that they detect first order serial correlation in stock prices. Interesting hypotheses are suggested by the sign of the serial correlation in each market. Positive serial correlation is likely to result from slow incorporation of new information, insider dealing, or infrequent trading. The evidence suggests that securities in Mexico and Chile exhibit a high degree of positive serial correlation; since these are both actively traded markets, the explanation is likely to be rooted in information inadequacies. There are good reasons to believe there are informational inadequacies in many emerging markets; there may be barriers to the dissemination of information, and companies appear to divulge less information with a greater time lag than is the norm in developed markets. Moreover, if the cost of capital to speculators is high, which it is likely to be in a heavily regulated financial system, then the volume of trading (and particularly the volume of arbitrage) will be lower than is necessary for efficient pricing. On the other hand, negative serial correlations are more likely to occur in thin, speculative markets; Zimbabwe appears to be the emerging market with the most strongly negative serial correlation, and since it is very thinly traded, it is more prone to speculative influences.

An important issue here is that of speculation. While it is generally recognized that a certain volume of speculation is needed to maintain market liquidity and efficient pricing, concerns are frequently expressed that speculation can be destabilizing and therefore disruptive to market development. This is particularly important in developing countries because they tend to have heavily regulated financial systems. The more regulated the system, the more likely it is that the stock market will act as a kind of release valve for speculative pressures that, in a freer system, would be released elsewhere. In Korea, for example, connections have often been noted between developments in the stock market and those in real estate. The high degree of volatility in the Taiwanese stock market is also frequently attributed to the heavy volume of speculative trading there. In order to avoid too much speculative pressure on a market, therefore, stock market development should proceed in tandem with the liberalization of the financial sector.

III.4. International Aspects

It is increasingly clear that stock markets in developing countries represent a valuable mechanism through which investors and corporations can become better integrated into world capital markets. Institutional investors in developed countries, such as mutual funds, pension funds, and insurance companies, wish to diversify their assets geographically and have taken advantage of country investment funds to do

this. IFC has played a major role in developing country and regional funds, bringing international portfolio investment to a number of developing countries. Funds sponsored by IFC have led to investment flows of $1.3 billion into emerging markets; and there have also been many others launched by other organizations.

It is estimated that the current stock of equity investments held by nonresidents in emerging markets may be as high as $17 billion, less than 3 percent of emerging markets' capitalization. The assets of known country funds amount to approximately $11 billion; the balance is accounted for by those countries where there are few, or no, restrictions on direct foreign participation and by local investment vehicles that are effectively fronts for overseas investment. The annual flow of portfolio investment into developing countries, in recent years, has been at least $500 million and may have been as high as $1 billion.

Although these sums are small in relation to other financial flows (for example direct foreign investment in developing countries was $18.7 billion in 1988 and $17.5 billion in 1989), there is the potential for vastly increased flows of portfolio investment. The total assets of institutional investors in the major markets of Europe, Japan, and the United States are put at $7.5 trillion and are growing at approximately 15 percent per year. Of these holdings, about 10 percent (i.e. $750 billion) is held in foreign equities. If nonresident holdings in emerging markets are $17 billion, these holdings amount to a mere 2

percent of institutions' foreign holdings, and less than a quarter of one percent of their total equity holdings. Even a small increase in the desired stock of equity holdings in emerging markets could produce a dramatic increase in the annual flow of inward investment.

Four factors will play a major role in determining the volume of these inflows. The first is the supply of new equity into the market, since without this new supply, emerging markets will have difficulty absorbing significant new inflows of investment. The second is the prospect for returns in developing country stock markets. This depends partly on the performance of those economies and stock markets and partly on the covariance structure between the markets among which investors allocate their portfolios. Developing country stock markets have been popular with investors because they have offered high realized returns and the opportunity for diversification into markets that are not highly covariant with markets in OECD countries.[13]

As Table 7 reveals, emerging markets have low correlation coefficients, both with each other and with markets in the major OECD nations. Of course, since index-linked investment vehicles are not available in emerging markets, investors are concerned with the performance of individual stocks as well as the market as a whole, but the low correlation coefficients provide an indication of the attraction of emerging markets to a diversified international portfolio investor.

TABLE 7: Correlation Coefficients of Stock Markets

(five years ended December 1989)

	USA	UK	Japan	India	Korea	Malaysia	Mexico	Brazil
USA	1.0	0.76	0.13	-0.03	0.28	0.52	0.34	0.03
UK		1.00	0.00	-0.06	0.18	0.59	0.36	0.02
Japan			1.00	-0.04	0.17	0.14	0.14	0.05
India				1.00	-0.03	-0.03	0.02	-0.04
Korea					1.00	-0.04	0.12	0.18
Malaysia						1.00	0.38	0.06
Mexico							1.00	-0.10
Brazil								1.00

Source: IFC

The table measures correlation coefficients among market indices. The U.S. index is the S&P 500; the U.K. index is the FT-100; the Japan index is the Nikkei. For developing countries, the IFC indices have been used.

The third key factor is the regulatory and tax environment, particularly in the host country. The regulatory structure affects two critical considerations for a foreign investor's decision to place portfolio funds in a developing country stock market. The first is the legal basis for enforcement of contractual claims, e.g., equity. If claimants' rights, such as voting rights, dividend receipt and remittance, and marketability/good delivery of shares and funds are not

honored, there must be a credible and immediate enforcement procedure for foreign transactions. The second is the credibility and efficiency of the market process. Monitoring and credible enforcement of trading and share-pricing standards are required. These must address critical issues such as share price or information manipulation, inside trading, and market-maker roles including capital adequacy. The tax regime and capital remittance controls can also have a large impact on portfolio inflows and returns.

The fourth key factor is availability and disclosure of accounting, financial, and strategic information to outside investors. Audited corporate financial information conforming to the standards of generally accepted accounting principles is needed. Disclosure and immediate widespread dissemination of that information to foreign investors and their agents is a necessary condition for an adequate level of pricing efficiency in the stock market.

Because of a range of difficulties in gaining access to emerging markets, country funds have been the preferred vehicle for portfolio investment in them. The popularity of such funds has been amply demonstrated by the premiums to asset value that many of them enjoy: premiums that have been particularly marked in the case of funds listed on the New York Stock Exchange. While these premiums are easy to explain when they are the result of heavy retail demand and restrictions imposed on foreign portfolio investment, they are not popular among institutional

investors. Increasingly, as emerging markets liberalize and permit direct foreign investment, institutional investors are likely to avoid funds in favor of the kinds of direct activity to which they are accustomed in developed country markets. It is already apparent that new funds coming to the market have to offer new features to differentiate themselves in the eyes of investors. One major growth opportunity for funds, however, is the retail market, which is likely to grow considerably as individual investors become more sophisticated about international diversification and emerging markets become less risky.

In Korea, there has been progressive liberalization of the restrictions on international access to its capital markets, and this liberalization will continue. There are currently seven international funds invested in Korea, representing a value (at time of offering) of $299 million. The funds currently enjoy premiums over net asset value of at least 70 percent, a reflection of the difficulty of gaining access to the market except through these funds. India's market is more restricted, although there are a number of incentives for nonresident Indians to participate, and further liberalization is planned. There are five country funds invested in India, three of which are trading at a premium to net asset value, and one of which is a regional fund, investing in India along with other Asian markets. At least two further funds are currently being planned.

IV. Policy Implications

IFC is heavily involved in capital market development in developing countries. There are three main aspects to its involvement. First of all, it is the focal point for Bank group technical assistance on capital markets. There is, therefore, a large program of technical assistance in a large number of member countries. Secondly, IFC makes direct investments, in the form of both equity and loans, in financial markets institutions. Thirdly, IFC's activities with the Emerging Markets Database and various country funds are helping to stimulate portfolio investment in stock markets in developing countries. For all these reasons the Corporation has a vital interest in the economic underpinnings of stock markets.

World Bank operational activity in the financial sector reform areas is also growing rapidly. Policy recommendations in support of capital market development have already been part of several recent financial sector loans (Jamaica, Kenya, Pakistan), and that trend is expected to accelerate as staff gain more competence in handling the various complex issues of capital market development and its links with the macro and financial system. Clearly, the dominance of banking in the financial system of most developing countries in conjunction with severe insolvency problems affecting much of the banking sector have tended to crowd out formal consideration and analysis of capital market issues. These issues have not figured prominently on policy agendas, nor in loan

agreements. To the extent that the prevailing problems of the banking sector originate from unbalanced capital structures at the corporate level and the lack of development of equity markets, it is clear that capital market development needs to be viewed as an essential ingredient in reform of the banking sector. This element of complementarity between the banking sector and the securities markets deserves further attention.

The interest taken by the Bank and IFC in these issues reflects the broader interest in the important policy questions that surround financial markets. As we indicated earlier, there is much debate over what kinds of financial institutions and markets best serve economic growth; interestingly, this is a debate that has as much vitality in the context of developed as developing countries. Prominent in current debates over the competitiveness of industrial nations are issues of both corporate financial structure and financial market organization.

In the context of developing countries, the key issues surround equity market development. Under what conditions does it make sense to encourage the development of equity markets? Is a functioning equity market a prerequisite to successful liberalization of the banking system? Is it useful to think in terms of an optimal debt/equity mix for a developing economy, or for corporations in developing countries?

More specific issues concern the regulatory environment. It is difficult to devise a regulatory system that contributes to the

efficiency of the market in a cost effective way: even in advanced countries, regulatory regimes are subject to frequent changes in response to new concerns and as market innovations lead to new products and new ways of doing business. Yet the importance of regulation cannot be overstated, particularly for developing countries anxious to link their markets into the global financial system; without effective regulation, international investors will not have the confidence to commit resources to developing country markets. Hence a vitally important policy question is, what is the appropriate regulatory regime for a developing country securities market?

A final policy issue concerns corporate management. Good management skills are scarce in developing countries; the policy question is how to arrange matters so that scarce management resources are used optimally. The role of the stock market in effecting changes in corporate governance is potentially of enormous benefit in the process of economic development.

Despite the importance of these issues to the Bank group, they have not been the subject of sustained research activity and, as this paper has argued, there are a number of important issues that remain to be empirically examined in a developing country context. We plan to examine them in the coming months.

FOOTNOTES

1. See for example, the studies by Mayer (1988) and Bayliss & Phillip (1980), which compare the economic performance of the U.S. and the U.K. (economies with active stock markets and ones in which external, traded equity plays an important role in corporate finance) with that of West Germany and Japan (economies where corporations have closer relationships with banks and where, although the banks may hold equity in companies, the role of publicly-traded equity is much smaller). Given the superior economic performance of West Germany and Japan, these studies tend to be used to support bank-based systems.

2. It is interesting to compare this pattern of Korea's stock exchange market growth in the 1980s with that of more mature and developed markets such as the U.S. market. In the United States the dynamic growth has come from the secondary market reflecting a substantial adjustment in asset returns and corporate restructuring. Indeed, the net contribution of the market to corporate finance has, since 1984, been negative [see Bernanke and Campbell (1988) and Kaufman (1986), for details].

3. Based on flow of funds data for the total corporate sector and using annual average of 1985-1987 period. Furthermore, taking into account the amount of funds raised through bond issues, corporations rely almost as much on securities issues to meet their external financing requirements as on loans from financial institutions.

4. India has fifteen stock exchanges, but by far the largest is that in Bombay. It accounts for approximately 70 percent of the capitalization and turnover of all the exchanges. In this paper, all figures refer to the Bombay Exchange only.

5. Calculated from data from the Reserve Bank of India.

6. In Korea, the stock market index grew at an average annual growth rate of 21.5 percent in real terms between 1980 and 1988, with much of the growth taking place in the last three years. In India, the stock market index has been more erratic, but still shows a real average annual growth rate of 17 percent over the same period.

7. Theoretically, this relationship between stock market growth and rise in corporate real investment can be explained as the interaction of two mutually reinforcing developments: (i) an increase in productivity associated with a higher level of real investment, resulting in higher profitability and a higher net return on equity capital; and (ii) a decrease in the cost of equity because of the higher share prices, resulting, in turn, in a shift to more equity financing and to higher levels of investment. For empirical analysis of the relationship between stock market and investment in industrial

countries see, Fischer and Merton (1984), and Mullins and Wadhwani (1989).

Empirically, the relationship between aggregate corporate real investment and stock market in Korea is estimated by the following regression equation:

$$DLI = -0.63 + 0.11\ DLSP_{-1} \quad (1.75)\ (1.35)$$

$$+ 1.81\ DLY + 0.0009\ DRR \quad (4.47)\ (0.55)$$

$$+ 0.342\ DLTB \quad (6.42)$$

$$R^2 = 0.82,\ DW = 1.46$$

annual data, 1964-1986; method of estimation OLS; the variables are defined as:

DLI	= growth rate of real corporate investment
$DLSP_{-1}$	= lagged growth rate of real stock market price index
DLY	= real GDP growth rate
DRR	= change in real corporate borrowing rate
DLB	= change in real total loans from financial institutions.

8. Total capital employed is defined as the sum of fixed assets, net of depreciation, plus inventories, where both are measured at current replacement value. See Appendix A for further details.

9. Only under the perfect capital market assumption and with no taxes, it is true that the long-term value of Q is equal to one. With taxes or debt subsidies, the equilibrium value of Q could diverge from unity. See Dailami (1988, 1990) for details.

10. Korea regulations used to require that new issues be priced at par. These regulations were altered in December 1983 to allow pricing at market value, but the new system did not become fully effective until 1988.

11. In the case of Korea, one can identify three important nonmarket forces at work. First, the government exerted a great deal of pressure on corporations to raise equity. Secondly, there were large sales of the government's own equity holdings in firms. Thirdly, in the late 1980s, the government was anxious to increase the supply of equity ahead of national elections.

12. Cho's argument is that banks do not allocate capital efficiently because they tend to prefer well-established, safe borrowers. Equity markets can finance the risky yet productive borrowers that bankers avoid but, in the absence of a well-functioning equity market, it is possible that regulation, by constraining the freedom of banks, will lead to a better allocation of capital than an unrestricted credit market.

13. There is an extensive literature on the benefits of diversification. One key early paper is Levy & Williamson (1970), and a more recent paper that takes developing country markets into account is Errunza & Losq (1977).

APPENDIX A
Definitions and Data Sources

This appendix describes the methodology, definitions, and data sources for the measures of corporate profitability in Korea reported in the tables.

A. Real Return on Capital

$$\text{Real return on capital} = \frac{\text{(operating profit + before taxes + capital consumption at historical cost - replacement cost of depreciation - inventory adjustment)}}{\text{(capital employed at current replacement value)}}$$

where capital is defined broadly to include machinery and equipment, structures and inventories; fixed assets were calculated at replacement cost value, based on perpetual inventory value, using an average depreciation rate of 0.091; and bench mark value for 1962 obtained from Pyo (1988). Inventories were measured at market value, after adjustments for inflation and inventory turnover were taken into account.

B. Investors' Returns on Financial Assets

(i) Return on stock market = after tax dividends + capital gain - rate of inflation measured by the GDP implicit price deflator;

(ii) Return on government bonds = after personal tax return on government bonds - rate of inflation;

where the personal tax rate on government bonds has been set at 17% since 1982. Capital gains are tax exempt in Korea, while dividend incomes are taxed at a relatively high rate, averaging 57.6 percent for total shareholders over the 1982-1986 period. See Dailami (1990) for details.

C. Tobin's Q Ratio

$$Q = \frac{\text{market value of equity + book value of debt}}{\text{capital employed at current replacement value.}}$$

D. Sources of Data

The primary source for most of the data used is the Economic Statistics Yearbook (ESYB), Bank of Korea, various issues. Two sets of flow of funds tables, i.e. the Integrated Accounts of National Income and Financial Transactions, and Financial Assets and Liabilities, contained in this publication were utilized to generate the necessary balance sheet data for the total nonfinancial corporate sector for the years 1963-1986. These data were supplemented, when necessary, by drawing on several other sources, including National Accounts (NA), Bank of Korea; Korean Taxation (KT), Ministry of Finance; Securities Statistics Yearbook (SSYB), Korea Stock Exchange; and Securities Market in Korea (SMK), various years, The Korea Securities Dealers Association.

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